

NASA TECH BRIEF



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Miniature Oxygen Resuscitator

The problem:

Development of a small, lightweight, portable resuscitator for use during evacuation of patients to medical facilities.

The solution:

A miniature resuscitation system weighing 4 lb with a 10-minute supply of oxygen or 8 lb with a 30-minute supply. A carrying case contains a modified resuscitator head, a cylinder of oxygen, a two-stage oxygen regulator, a low-pressure tube, and a mask for mouth and nose.

How it's done:

The standard resuscitator has been modified by elimination of the mixing of air with the oxygen; 100% oxygen is now administered. The unit is cycled to give a positive patient pressure of 14 ± 2 mm-Hg and a negative patient pressure of 9 ± 2 mm-Hg when the constant source pressure is 22 ± 2 lb/inch² (gauge). Increase (or decrease) by 1 lb/inch² in the supply pressure increases (or decreases) the patient-pressure range by about 2 mm-Hg. A safety valve limits the patient's positive pressure to 21 ± 2 mm-Hg and his negative pressure to 17 ± 2 mm-Hg; a manual override permits a continuous flow at the valve's setting. The flow of oxygen is generally constant throughout the positive and negative phases of the resuscitator's cycle, falling between 11 and 13 liter/min as measured at the 22-lb/inch² supply line.

The 50-inch³ oxygen cylinder accords with MIL-C-7905 and MS-26545.

The regulator consists of a two-stage pressure reducer and a shut-off valve directly mounted on the tank. With an input pressure ranging from 50 to 2,000 lb/inch² the reducer delivers a steady 22 ± 3 lb/inch² (gauge). The quick-turn (maximum of 180°) valve, on the high pressure side, isolates the oxygen supply from the rest of the system. The high-pressure side has an L-2 type of pressure gauge, a standard aircraft-type filler port, and a high-pressure-blowout port set at 2,600 to 2,800 lb/inch². Only special lubricants may be used in the system.

The resuscitator head is permanently attached to the pressure regulator by an 18-inch flexible tube made of poly(vinyl chloride) reinforced with nylon. The tube has an internal diameter of 3/16 inch and a burst pressure of $\geq 1,000$ lb/inch².

The colorless and transparent mask, equipped with an inflatable cushion for airtight sealing around the patient's mouth and nose, is directly attached to the patient-outlet nipple of the resuscitator head.

The resuscitator should be useful at first-aid stations at beaches, swimming pools, factories, and hospitals, and for rescue crews and ambulances.

Note:

No further documentation is available. Inquiries may be directed to:

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Reference: B69-10319

(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

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